

WHAT IS CLAIMED IS:

1                   1.       A magnetic read/write head having a protective coating comprising:  
2                   a highly tetrahedral amorphous carbon.

1                   2.       A magnetic recording media for use with a read/write head, the media  
2 comprising:  
3                   a substrate;  
4                   a magnetic layer disposed over the substrate; and  
5                   a protective layer over the magnetic layer, the protective layer comprising a  
6 highly tetrahedral amorphous carbon;  
7                   wherein the protective layer has a thickness of less than about 50 Å and a  
8 hardness of over about 80 GPa;  
9                   wherein the protective coating is adapted for use during continuous contact of  
10 the media with the read/write head; and  
11                  wherein the media has an areal density of over 1 gigabyte per square inch.

1                   3.       A method for depositing a protective coating comprising a continuous  
2 highly tetrahedral amorphous carbon on a substrate, the method comprising:  
3                   ionizing a source material so as to form a plasma containing ions which  
4 comprise carbon; and  
5                   energizing the ions to form a stream from the plasma toward the substrate so  
6 that carbon from the ions is deposited on the substrate, wherein the ions impact with an  
7 energy which promotes formation of sp<sup>3</sup> carbon-carbon bonds.

1                   4.       A method as in claim 3, wherein the carbon is deposited on the  
2 substrate at a rate higher than about 10 Å per second.

1                   5.       A method as in claim 3, wherein the source material comprises  
2 acetylene.

1                   6.       A method as in claim 3, wherein the substrate comprises at least one  
2 of magnetic recording media, glass, optics, machine tools, and integrated circuits.